References: Jorge, Carlos Alexandre Fructuoso et al. (2016): Argonauta Video Database. Data Agregation. Instituto de Engenharia Nuclear. < http://carpedien.ien.gov.br:8080/handle/ien/1730>

Argonauta Video Database

(Under construction)

Description

This Database was generated during the development of a computer vision-based system for safety purposes in nuclear plants. The system aims at detecting and tracking people within a nuclear plant. Further details may be found in the related thesis.

The research was developed through a cooperation between the Graduate Electrical Engineering Program of Federal University of Rio de Janeiro (PEE/COPPE, UFRJ) and the Nuclear Engineering Institute of National Commission of Nuclear Energy (IEN, CNEN). The experimental part of this research was carried out in Argonauta, a nuclear research reactor belonging to IEN.

The Database is made available in the sequel. All the videos are already rectified.

The Projection and Homography matrices are given in the end, for both cameras.

Please, acknowledge the use of this Database in any publication.

Doctoral thesis link: http://carpedien.ien.gov.br/handle/ien/1463

Description of the scenes and video files:

A number of scenes were recorded within Argonauta's room for this research. They are grouped in the following classes:

- "Scenes for Spectrography experiment",

- "General simulated scenes",

- "Real operation scene".

Details are given in the sequel.

Scenes for Spectrography experiment

Scenes were recorded following the tasks involved in spectrography experiments, which are carried out in front of "J9" output radiadion channel, the latter in open condition. These tasks may be executed by one or two persons. One person can do the tasks, but requiring him to crouch in front of "J9" to adjust the angular position the experimental appartus (a crystal to bend the neutron radiation to the spectograph), and then to get up to verify data in a computer aside; these movements are repeated until achieving the right operational conditions. Two people may aid one another in such a way one remais crouched while the other remains still in front of the computer. They may also interchange tasks so as to divide received doses.

Up to now, there are available two scenes with one person and one scene with two persons. These scenes are described in the sequel:

- Scene 1:

Comprises one of the scenes with one person performing spectography experiment.

Video file labels:

"20140327181335_IPCAM": recorded by the right camera,

"20140327181336_IPCAM": recorded by the left camera.

- Scene 2:

Another take similat to Scene 1.

Video file labels:

"20140327180749_IPCAM": recorded by the right camera,

"20140327180750_IPCAM": recorded by the left camera.

- Scene 3:

Comprises the scene with two persons performing spectography experiment.

Video file labels:

"20140327182905_IPCAM": recorded by the right camera,

"20140327182906_IPCAM": recorded by the left camera.

Scenes for Spectrography experiment

	Obs.	Video file		Frame rate	Annotation
Scene 1 (Right camera)	One person	20140327181335	112.8 MB	29.91 fps	Download
Scene 1 (Left camera)	One person	20140327181336	56.8 MB	29.32 fps	Download
Scene 2 (Right camera)	One person	20140327180749	46.8 MB	29.83 fps	Download
Scene 2 (Left camera)	One person	20140327180750	40.9 MB	28.48 fps	Download
Scene 3 (Right camera)	Two persons	20140327182905	113.1 MB	29.80 fps	Download
Scene 3 (Left camera)	Two persons	20140327182906	113.1 MB	28.36 fps	Download

These scenes correspond to a typical task executed within Argonauta room.

General simulated scenes

These scenes followed a pre-defined script (see the Thesis for details), with common movements corresponding to general experiments. People go to or stand still in front of "J9", and/or go to the side of Argonauta reactor and come back again.

The first type of movement is common during Irradiation experiments, where a material sample is put within the "J9" channel; and also during neutrongraphy or gammagraphy experiments, where a sample is placed in front of "J9". Here, the detailed movements of putting samples on these places were not reproduced in details, but only the whole bodies' movements were simulated (as crouching or being still in front of "J9").

The second type of movement may occur when operators go to the side of Argonauta to verify some operational condition.

- Scene 1 (Obs.: Scene 1 of the "General simulated scenes" class):

Comprises one of the scenes with two persons. Both of them use clothes of light colors. Both persons remain still in front of "J9"; one goes to the computer and then come back, and both go out.

Video file labels:

"20140326145315_IPCAM": recorded by the right camera,

"20140326145316_IPCAM": recorded by the left camera.

- Scene 2:

Comprises one of the scenes with two persons. Both of them use clothes of dark colors. Both persons go to the side of Argonauta reactor and then come back and go out.

Video file labels:

"20140326154754_IPCAM": recorded by the right camera,

"20140326154755_IPCAM": recorded by the left camera.

General simulated scenes

	Obs.	Video file		Frame rate	Annotation
Scene 1 (Right camera)	Two persons	20140326145315	9.8 MB	29.43 fps	Download
Scene 1 (Left camera)	Two persons	20140326145316	10.9 MB	28.90 fps	Download
Scene 2 (Right camera)	Two persons	20140326154754	11.9 MB	29.87 fps	Download
Scene 2 (Left camera)	Two persons	20140326154755	14.1 MB	29.76 fps	Download

These scenes followed a script based on typical tasks executed within Argonauta room.
(The videos above for one person are under pre-processing).

Real operation scene

This scene was recorded during a real Irradiation operation, more specifically during its final tasks (removing the irradiated sample). This scene was an extra recording to the script and planned ones.

- Scene:

Involved a number of persons, as: two operators, two personnel belonging to the radiological protection service, and the "client" who asked for the irradiation.

Video file labels:

"20140402150657_IPCAM": recorded by the right camera,

"20140402150658_IPCAM": recorded by the left camera.

Real operation scene

	Obs.	Video file		Frame rate	Annotation
Scene 1 (Right camera)	More persons	20140402150657	MB	fps	Download
Scene 1 (Left camera)	More persons	20140402150658	96.6 MB	fps	Download

This scene was acquired during a real Irradiation operation, comprising more people, as operators and radiological protection personnel.
(The video above for the right camera is under pre-processing).

Projection and Homography matrices

	Projection	Homography
Right camera	Download	Download
Left camera	Download	Download

Description of the Annotation files:

Annotation files are supplied for each video, for benchmarking. Annotations correspond to ground truths of peoples' positions in the image plane, and also for their feet positions, when they were visible.

Annotations were performed manually, with the aid of a code developed by (Silva et al., 2014; see the Thesis for details). Targets (people or feet) are marked at variable frame intervals and then linearly interpolated.

Description of file:

Each line correspond to a target annotation. Each target is given a label, beginning from "object0", and so on.

Each column corresponds to, from left to right:

Object label, frame number, upper-left image coordinate x, upper-left image coordinate y, bottom-right image coordinate x, bottom-right image coordinate y.